Menlo Park Notebook #174 [N-80-11-09]

This notebook covers the period October-November 1880. Most of the entries are by Francis Jehl. There are also a few entries by Francis Upton. The book contains notes and calculations relating to lamp tests. A few of the entries concern tests of meters. The label on the front cover is marked "Lamps C" and "Francis Jehl." There is an index on the inside front cover. The book contains 282 numbered pages.

Blank pages not filmed: 234-235, 264-265.

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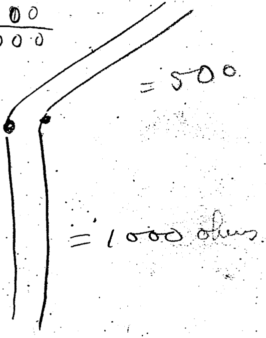
Res one arm of Bridge
70.3 ohms

12600
1400
14000



First Lamp. good vacuum.

Em7 182–183 Pt 3683

R $\frac{31400+4500}{2000}$ = 179 R

C 16 [illegible] test

at Oct 27 and [illegible]

R 193

Pt 3529

25150
5800
2000) 30950 (15
...09
...00
...

No 1c. 3/8 Spark

Em7 167–167 1110

R $\frac{25150+5800}{2000}$ 1.54 R

C 16 Pt Clamp 3544 [illegible]

167
167
3) 334
11.1

154

154) 545820 (3544
462
838
770
687
616
660

The following on inside of front cover.

$R^0 = \frac{4}{5}$ $\frac{4}{5} = 1^0 C$

$\frac{4}{5}$

$\cancel{20}^{C}$

$x C^0 = \frac{4}{5} R$

$20 R = x C^0$

$20 : x : \frac{4}{5} : 5$

2e

Ent	218 218	1450
R	$\frac{37650 + 6800}{2000}$	222R
C	16	Fe 4195 Hb

$$\begin{array}{r} 37650 \\ 6800 \\ \hline 20)4445 \end{array} \rightarrow 222R$$

604

88

45

$$\begin{array}{r} 218 \\ 2 \\ \hline 3)436 \\ \hline 145 \end{array}$$

222)93140(4195

888

434

222

2120

[illegible]

1230

3e

Em.7 190 — 190 126v

R $\frac{37650}{2000}$ 188 R

@ 16 Jle ~~3070~~ 3730

190_2

$3\,|\,380$ 126.

$200)\,37650\,(188$

20

176

160

165

[illegible]) 703310 (3740

[illegible]

4 c

Ell7 189 − 189   126 v

R $\frac{37650 + 300}{200}$ 189 R

3721

C 16   Je

189
2
3)378
126

37650
300
20)37950(189
20
179
160
195

64)70310(3721
567
1363
128
401
378
230

5—e

Emt 188 188 1220

R $\frac{37650 + 300}{200}$ 189R

P 16 Fe 3488 lb

$\frac{188}{2}$

3)376

122

37650
200

20)37950(189
20
179
160
185
188

189)659360(3488
567
923
756
7
1676
1512
1640

6c

Em7 192 − 192 = 128 ℧

$\frac{37650 + 4200}{200}$ 209 ℞

R 3473 4/10

@ 16 Pe

192
2
3 | 384
128

37650
4200
20) 41850 (209
40
1

10
209) 72581.0 (3473
627
989
836.0
1531
1463
680

7^c

Emf 192-192 1280

204 R

R $\frac{37650 + 3200}{200}$

Me 3552 /ℓℓo

C 16

$\begin{array}{r} 192 \\ \underline{2} \\ 3\overline{)384} \\ 128 \end{array}$

$\begin{array}{r} 37650 \\ \underline{3200} \\ 20\overline{)40850} \\ 204 \end{array}$

204)725510(3552
612
1138
1020
1180
1020
600

γe

Emt 191 — 191 127v

R $\frac{37650 + 3700}{200}$ 206R

C 16 Je 3468 ftlb

$3)\underline{382}$ 191½

127

37650
3700

20) 41350 (206
40
135

206) 71480 (3468
618
965
824
1412
1236
1760

9e

Elw7 184 — 184 123 P

R $\frac{37600 + 2000}{200}$ 198 R

C 16 3384 ftlbs

184
2
3)368
123

37650
2000
20)39650(198
20
196
180
165
160

198)670210(3384
594
762
594
1681
1584
970
8 3

198
8
1584
7

10.e P

Elut 203 - 203 1350

R $\frac{31400 + 500}{2000}$ 159 R

O 16 Ge 5077 lbs

This one has a ghost,

202
3|406
135

31400
500
2|319~~00~~
159

159) 807370 (5077
795
1237
1113
1240

159
4
636

159
8
1272

11e Nu"

Elut

R

C

190 – 190 1235

188R

$\frac{37650}{200}$

16

20) 3765 (188

12

16

3564 ft lbs

190

2

3) 380

123

20

188) 67021 0 (35.4

1062

940

1221

930

1R Ni

EMF 193 − 193 129V

R $\frac{37650 + 1500}{2000}$ 195R 12

C 16 3780 Abb

A [illegible] the Carbon

$193 \times 2 = 386$

$3)386$ 128

$2 \quad 37650 + 1500$

$20)39150(195$

191

180

115

$195)737700(3780$

585

1522

1365

1570

1560

0 5

13 Mi

Eut 173 – 173 1150

R $\frac{31400 + 500}{200} = 159$ R

C F6 36-1 [illegible]

Agin the globe

$$\begin{array}{r} 173 \\ 3)\overline{346} \\ 115 \end{array} \qquad \begin{array}{r} 31400 \\ 500 \\ \hline 2)\overline{31900} \\ 159 \end{array}$$

$$\begin{array}{r} 159)\overline{5570} \\ 477 \\ \hline 1085 \\ 954 \\ \hline 1347 \\ 1327 \\ \hline 250 \end{array}$$

368

Emt 173 − 173 = 115 v

155 R

R $\frac{31400 + 4700}{200}$ 3779 #lbs

C .16

31400
4700
2|36100
155

173
2
3|346
115

155) [illegible] (3779
465
1208
1085
1237
1085
1520
1395

15e Ni

Poorly Clamped

Ew# 207 207. 1380

R $\frac{37650 + 4500}{2000}$ 210 R

407 [illegible]

C 16

207½

3)414

138

37650
4500

20)42150 (210
40
26
15

210) 843650 (4017
840
365
365
1550

16 Ni

Cu 198 – 198 = 1320

R $\frac{37650 + 6500}{200}$ 220 R

3509.7 cs

@ 16

1.98 – 198
3)396
132

37650
6500
20)44150(22
40
41

220)772020(3509
660
1120
1100

17 Ni

Em7 195 – 1.95 = 130 U

R $\frac{37650}{200}$ = 188 R

392×1.6

© 16

---

195 × 2

3)390
130

20)37650 (188
20
176
160
165
160

188)74670 (392
564
1846
1792
547
376
1710

188
2
26

223) 18362.0 (35.14

[illegible]

870

Ebit 200 - 200 1330

R $\frac{37650 + 7000}{200} = 223$

3514 lbs

C 16

Blue at the lamps and Hg in the globe

$3)\underline{400}$
133

37650
7000

20) 44650 (223
40
46
40
65
60

19^{e} ni

Emf 190 − 190 = 127 v

R $\frac{37650 + 700}{2000}$ 191 R

3740 ftlbs

R 16

$\frac{190}{2}$

3 | 380 / 1.27

37650
700

20) 38350 (191
20
183
180
31

191) 714520 (3740
573
1415
1337
782
764
18

20^{c} Ni

[illegible] 187 − 187 = 1240

183 R

R $\frac{31400 + 5300}{200}$

37[illegible]

C 16

$$\begin{array}{r} 187 \\ 2 \\ \hline 3)\,374 \\ 124 \end{array} \qquad \begin{array}{r} 31400 \\ 5300 \\ \hline 2\,|\,36700 \\ 183 \end{array}$$

183) 67160 (3722

54971

1321

1281

406

366

400

21e hi

Emt 195-195 1300

R $\frac{37650 + 700}{200}$ [illegible]

© 16 [illegible]

195
2
3)390
130

37650
700
20)38350(191
20
183
180
35
20
15

191)748670(3919
573
1756
1719
~~1370~~
191
1790

R R^c Ri

Emt 185185 1235

177R

R $\frac{31400+4000}{200}$

3786 pu

C 16

185
2
3)370
123

31400
4000
2)35400
177

177)679320 (3786
531
1292
1239
1531
1416
1150
1062
88

177
1239

23e. Ré

Ent 194 – 194

1290
199 R

R $$\frac{37650 + 2200}{2000}$$

3704 ftlb.

@ 16

$$20\,\overline{)\,39850}\,(199$$

37650
2200
39850
20
195
185
185
180

194
3)388
129

$$199\,\overline{)\,737200}\,(3704$$

737200
597
1402
1393
900
995
4

24c Mi

Em7 178 – 178   117 V

184 R

R $$\frac{31400 + 5500}{200}$$ 3294 fills

C 16

$$3\overline{)356}$$ 178 2 117

31400 13700 2 36900 184

$$184\overline{)606420}$$ 3294

5524
574
368
1762
1656
8606
736

164
72

25e Ni

120 V
188 Ω

Emf 180 – 180

R $\frac{37650+100}{2000}$ 3393 [illegible]

C 16

```
 180
3|360
  120

20)37750
   177
   16
   175
   16

188)637920 (3393
    564
     739
     564
     1752
     1692
       600
       564
```

26^{c} Ni

Elu+ Very high resistance

R

C

Emt 195 − 195 130 v
200 R

R $\frac{37650+2000}{200}$

3243 [illegible]

e 16

37650
42150 200

195 20
2

3 | 390
130

200) 74867.0 (324.3
48
67
670

28e Mi

Em7 198—198 183 V
213 R

R $\frac{37650 + 5000}{2000}$

3624 lbs

C 16

Bad spot at Clamp

198
2
396
132

37650
5000
20)42650(213
40
26
20
6

213)772020(3624
639
1330
1278
520
426
970

29e Mi

Ent 183 — 183   122 V
189 R

R $\frac{37650+200}{200}$ 3488 [illegible]

C 16

$\frac{183}{366}$
122

37650
200

189)659340(3488

189

188
1

1676
1572
1640

3o^{e} Ni.

Emf 185 — 185 1235
171 R

R $\frac{31400 + 2800}{200}$

3919 [illegible]

C 16

185
3
3)370
123

31400
2800
34200
171

171) 6 ... 19 (3919
10
5 3 9
331
171
1600
1539

171
2
39

Cut 178 — 178   119 U
178 R

R 31400—0 + 3200—0

200

3632 ft lbs

C 16

178
2
3)356
119

31400—0
3200—0
2)346000
173

110
173)627332   3632
8   519
38   1083
1038
00553
519
440
446

32 C. Mi.

Elu# 184 − 185   1285
1738 R

R $\frac{31400 + 33000}{2.000}$

3874 lbs

C 16

Hg in the globe

184
185
3)369
123

31400
33000
2)[illegible]

173)67024.0.(3874
519
1512
1384
1281
1211
700
692

173
8
1384

173
7
1211

33e [illegible]

Eut 195 − 193 1290
228 R

R $\frac{37650 + 8000}{200}$

C 16 3233 ft lbs

195
193
3|388
129

37650
8000
20)45650 (2
43
56
165

228|737200 (3233
684
532
456
760
684
760

34c Fe
Oct 22

Em7 179 ÷ 179 = [illegible]
188

$\frac{37650+}{200}$

R

3337 lbs

C 16

179
2
3)358
119

20)37650

188)627330 (3337
564
633
564
693
564
1296

188
7
1316

35e Pte

Emt 189—190   126 v
20 x R

R $\frac{37650+4000}{200}$

@ 16   3381 fillo

189

379

126

37650
4000

20) 41650 (

208) 703310 (3381
624
793
624
1691
1664
270

36e 7e

EMF 185 – 185   1235

R $\frac{37650+1000}{200}$ 3472ft lbs

C 16

185
2
370
123
37650
1000
38650
193
6702
579
912
788
1401
1351
500
3472

193
5
965

193
8
44

37C Fe

Em7 184 184 123 5
184 0

Q $\frac{31400+5500}{200}$:

3642 ftlb

C 16

31400
5300
21364000
184

184
2
3)368
123

184)670210(3642
552
1182
1104
781
736
450

184
6
1104

38

Eust · 190 − 190 1275
194 R

R $\frac{31400 + 8500}{200}$ 3590 fills

C 16

190
2
3)380
1.27

~~31~~

31400
8500
2)39900
199

199)714520 (3590
597
1175
995
1802
1791
1.0

199
9
1791

3qe Fle

Cut 185 − 185

123
14 R

$\frac{31400 + 8500}{200}$ 3367 fillo

R

C 16

185
2

3)370
123

31400
8500

2)39900.0
199

199)670210(3367
597
732
597
1351
1194
1570
92

40 ©

Emit 173 – 175   116S
158R

R $\frac{31400 + 200}{200}$ 3772 ft lbs

© 16

$\begin{array}{r} 173 \\ 175 \\ \hline 3)\,348 \\ 116 \end{array}$ $\begin{array}{r} 31400 \\ 200 \\ \hline 2)\,31600 \\ 158 \end{array}$

$158)\,596000$ (3772
474
1221
1106
1150
1106
440

Jeh EH
EH

1 E

41^e^ Fe

C.Nit 179 − 179 119 v
174 R

R 31400 + 3400

2 00 3606 fth

31400
3400

16

2)34800
174

179
2
3)358
119

174)627339(3606
522
1055
1044
1130
08

42 ~~50~~ c 7e

C.M.F. 190 − 190 1270
1700

R $\frac{31400 + 4300}{200}$ 4014 ft lbs

C 16

$\frac{190}{2}$
3|380
127

31400
4300
2|35700
178

178) 7145 20 (4014
~~7124~~
~~[illegible]~~ 252
178
740
768

43e Fle

EM7 200 - 200

1880
210 (

R

$$\frac{37650 + 4500}{200}$$ 3731 fills

C

16

37650
4500

8 | 400
133

20) 4215 (210

210) 783620 (3731
630
1536
1470
662
620
320

44 Fle.

Elu7 200 — 200 1835

212 — R

R $\frac{37650 + 4900}{200}$ 3696 ft lbs

O 16

3)400

133

37650
4900
2042550 212

212)783620(3696
636
1476
~~1272~~
2042
1908
1340

45^{c} 7e

Aut 180 — 180   1200
184 R

R $$\frac{31400 + 5500}{200}$$ 3466 ft lb

C

31400
5500
2)36900
184

16
182
3)360

184)637920(3466
552
859
736
1232
1104
1280

2

46c Ai

EM4 175 − 175 1175

R $\frac{31400 + 8000}{200}$ 3766/100

C 16

175
2
31350
116

31400
8800
2|32200
161

161)606420(3766
4834
1234
1127
1072
966
1060

161
1127

47c

Elut 200 - 200

1335
212 R

Q $\frac{37650 + 4800}{2000}$ 3696ftlb

C 16

$3)\overline{4000}$ 133

37650
4800

20)42450(22
4
24
20
4

96
60
24

48c

Eimt 180 - 184 1210

R $\frac{31400+3500}{2000}$ 3727/ftlb

C 16

180
184
3864

174) 64856.00 (3727
522
1266
1218
480
348
1320
88

49e

EMF 202 - 202 134V

Q $\frac{37650 + 7000}{200}$ 3567 fillo

C 16

Carbon has a bad spot.

37650
7000
44650

```
223 ) 795450 ( 3.567
      669
      1264
      1115
       1495
       1338
        1570
        1561
```

50

Ernst

181 — 181

1915

R

C

31400 + 2700

2000

4412 ft 6

16

147) 648600 (~~4~~
441
07

147 (648600 (4.412
588
606
588
180
147
330
294

Volts	Ohms	Ft lbs
1 ✓ 111	154	3500
2 145	222	4195
3 ✓ 126	158	3730
4 ✓ 126	189	3721
5 ✓ 122	189	3488
6 ✓ 128	209	3473
7 ✓ 128	204	3552
8 ✓ 127	206	[illegible]
9 123	178	3384
✓ 135	159	5077
11 123	188	3564 ✓
12 ✓ 129	195	3780
13 ✓ 115	159	3681
14 115	155	3779
✓ 138	210	4017
✓ 132	220	3509
17 130	188	3928

Valts

~~38~~ – 127
~~39~~ – 123
~~40~~ – 116
~~41~~ – 119
~~42~~ – 127
43 – 133
44 – 133
~~45~~ – 120
~~46~~ – 117
47 – 133
~~48~~ 121
49 134
~~50~~ 121

~~18~~	133	223	3514
~~19~~	127	191	3740
~~20~~	124	183	3722
~~21~~	130	191	3919
~~22~~	123	177	3786
~~23~~	129	199	3704
~~24~~	117	184	3294
~~25~~	120	188	3393
[illegible]	120	200	32~~4~~3
~~29~~	122	189	3488
~~30~~	123	171	3919
~~31~~	119	176	3632
~~32~~	123	173	[illegible]
~~33~~	129	228	3233
~~34~~	119	188	3337
~~35~~	126	208	3381
~~36~~	123	193	3473
~~37~~	123	184	3642

20 cell

$$\frac{101.5}{20 \times 1.18} \times 419$$

2.0064
9.9666
86990
.6710

4.7

9.3290
2.62222
1.95712
1.95112
1.6464
7.6830
3.23318

Test of lamp No 37

Batteries 50.5 L
51 R
101.5

1 Candle

209 L 89.4 Volts
210 R
419

37650
3900
415.50
207.75 Ohms

1706. Ft.lbs.

9.3290
2.6547
1.9837 96.3
1.9837
1.6994
7.6920
3.3058 202.2

2 candles

225 L
227 R
225 L
226

225
226.5
451.5 96.3 Volts

37650 20.22 Ft. lbs
3000
40650
203.25 Ohms

9.3290
2.6875
2.0165
2.0165
1.6464
.7010
3804

3 candles

242 L
245 R
487

3 1/3 candles
103.7 Volts

37650
2250
39900
199

199 ohms

Batteries 51.5 R
50 L
101.5

240 ft lb

9.3290
~~2.6946~~
~~2.6~~

9.3290
2.6946
2.0236
2.0236
1.6464
7.7051
3.3987

Batteries Lamp adjusted

49.5 L
52 R
240 R from 3 candle

101.5

105.5 Volts

4 candles

~~245 L~~ [illegible]
248 R
247 L
495

37650
1800
39450
19725

2505 ftlbs

9.3290
2.7110

2.6400
2.6400
1.6464
7.7062

3.4326

5 candles

257
256 L

.258 R

514

109.5

37650
1700

39350

196.75

2707.5

Thus

9.3290
2,7259
2.0549
2.0549
1.6464
7.7122
3.4684

113.3

7 candles

265 L
267 R
532

113.3 Volts

37650
1150
3)38800
194. Ohms

2940 ft lbs

9.3290
2.7443

2.0733
2.0733
1.6464
7.7173

3.5103

9 candles

275 L

275 R
272 L
276 R for
37650
Sand.

8½ candles?
9 candles

+ 279 R
276

555

118.5

276
279

37650
700

38350

191.7

3239 ft.lbs.

6

·3

·300

17
·8
·025
2
·050

017
·008
·025
·050
·3

7 100 : 83 :: ·300

83
249
684
70·89
·300
·21267

800
12
9600

·212
800
169·600
64·8

9·2 makes [illegible]

8·3290
·7559
·0849
·0849
6464
7207
5369

11 candles

285
285 R
285 L
570

37650
400
38050
[illegible]5

1,21,5 [illegible]

3440 [illegible]

3290
7716
1006
1006
6464
7258
5734

19 candles

294 L
297 R
591

.1261 Volts

31400
6200
37600
188

3743 ft lbs

3290
7810

1100
1100
6464
7276

5940

16 1/4 candles

296—297

15 3/4 ÷ 17

16 candles

300 L
302 – 306

300
304

604

31400
6050

37450
187.25

1286 Volts

3926 Ft. lbs

3290
7860
1150
1150
6464
7312
6076

1815 candles

306 R
305 L
6 11

130.5

31,400
5750
37150
18575

4051

3290
7983
1273
1273
6464
7364
6374

4340 ft. lbs.

2½ cuttles

315 L
316 R
310 L
31400
5300
36700
183.5

316
312.5
628.5

1341 volts

4340 ft. lbs

27 candles

323 L

332 R 30 candles

31400 27 candles

5000

To 4800

33 candles

325 L

31 candles

325 L

330 R

325-336 L

3290
6998
0288
6258
6464
7089
4129

---

5 candles

249 L
252 R
501

106.8 Volts

31400
7700
391.00
1955

2588 ft.lbs

3290
7404
.0694
,0694
6464
7212
5064

9candles

272 L
277-276
275 L

273.5
27[illegible]
5500

31400
6600
38000
190

3209

3290
7582
0872
6872
6464
7258
5466

---

12 1/4 candles

284 L
284 f
289 R

284
289
573

122.4 Volts

31400
6200
37600
188

3520

3290
6160

9450
9450
6464
6840

22.04

1 candle

20.5 L
2

413

31400
10000

41.400

207.00

Batt.
48.5 L
51.5

1810

88.2 Volts

1661

Corrected curve

Candles			Ohms	Volts		
1			207.5 ✓	89.4 ✓		
2		4.25	203.25 ✓	96.3 ✓	6.9	
3		3.65	199.6 ✓	103 ✓	6.7	
4		2.1	197.6 ✓	106 ✓	3	
5		1.5	196.1 ✓	108.9 ✓	2.9	
6		1.3	194.8 ✓	111.6 ✓	2.7	
7		1.1	193.7 ✓	114	2.4	
8		1	192.7 ✓	116.2 ✓	2.2	
9		1	191.7	118.2 ✓	2.0	
10	1.4	.7	1910	119.9	1.7	
12	[illegible]	.7	189.6	123	1.55	3.1
14		.7	188.2	126	1.5	
16		.6	187	126.4	1.2	
18		.55	185.9	130.3	.8	
20		.6	184.7	132.1	.8	
22		.45	183.8	133.8	.8	

89.4 9513
9513
6464
6830 1
2320 1701

9836
9836
6464
6920 2
3056 2021

0128
0128
6464
6998 3
3718 2356

106 0253
0253
6464
7048 4
197.6 [illegible] [illegible]
4011 2518

108.9 0370
0370
6464
7075 5
196.1 4279 2678

111.6 0469
0469
6464
194.8 7104 6
4506 2823

---

114 0569
0569
6464
193.7 7129 7
4731 2972

116.2 0653 8
0653
6464
192.7 7152
4921 3105

118.2 0726 9
191.7 0726
6464
7175
5091 3230

119.9 ~~0751~~ 10
191 ~~0751~~
~~6464~~
~~7190~~
~~5156~~ ~~3278~~

0788
0788 3334
6464
7190
5230

123 0899
0899 12
6464
189.6 7221
5483 3535

---

126 1004
1004
6464 14
188.2 7253
5725 3738

128.4 1086 16
1086
6464
7282
187 5918 3907

130.3 1149 18

1149

185.9 6464

7307

6069 4045

20

132.1 1209

1209

184.7 6464

7336

6218 4186

22

133.8 1265

1265

6464

183.8 7357

6347 4312

51 e

210 - 210 140 Volts

$$\frac{37650 + 1400}{200} \quad 195$$

16

```
      37650
       1400
20)39050(195
   38
   18 0
```

250
2 2
3)500 22
166

52 e

227—227

227
227
454
151 Volts

$$\frac{07650 + 1400}{2000} \; 195$$

16

Blue at the Clays

37650
1400
20)39050(195
38
190
180
10

✓

5 2 e

Note with Lamp (nickel
nickel No 3

120 Volts

180 - 1.80

$$\frac{25150+53000}{2000} \quad 152$$

16

~~2~~5 25150
53000

$$20\overline{)30450}(152$$
20
104

54^c

$\frac{430}{143}$ Volts

215—215

37650+

208

430

$$\begin{array}{r} 37650 \\ 4000 \\ \hline 20\,)\,\cancel{4}1650\,(208 \\ \underline{40} \\ 1 \end{array}$$

55 C

Note with [illegible]
([illegible] marble [illegible]

190 − 190

190
100
790
123

$\frac{31400+}{200}$ 157

16

576c

7 35 - 9 35

$\frac{470}{153}$ Volts

$$\frac{37650+7500}{200}\ 225$$

16

$$\begin{array}{r} 37650 \\ 7500 \\ \hline 20\,)\,45150\ (225 \\ 40 \\ \hline 51 \\ 40 \\ \hline 115 \end{array}$$

✓

57e

207 = 207

$\frac{444}{134}$ Volts

$\frac{37650+}{200}$

188

Blue at the clamp

```
200)37650(188
    200
    176
    160
    165
```

✓

Note (median no 5)

198—198 $\frac{1396}{132}$ votes

$$\frac{31400 + 20000}{200} \quad 167$$

16

Bluecoat Cheddar

$$\begin{array}{r} 31400 \\ \underline{2000} \\ 2\,)\,\underline{33400} \\ 167 \end{array}$$

59e

198 — 198

$\frac{396}{132}$ Volts

$\frac{31400 + 7000}{2000}$ 192

16

$$\begin{array}{r} 31400 \\ 7000 \\ \hline 2\,)\,38400 \\ \hline 192 \end{array}$$

60 c

Note (No 2 Machine)

205 205 $\left(\frac{410}{133}\right.$ Volts

$$\frac{31400+3000}{200} \quad 172$$

$$\begin{array}{r} 31400 \\ 3000 \\ \hline 2)34400 \\ \hline 172 \end{array}$$

Unit (No 3 Nickle)

217-218

$$\frac{37650 + 2000}{2000} \quad 198$$

217
218
435
145 Volts

16

Blue at the clamp.

✓

37650
2000
20)39650(198
2
196
180
165
160
5

134 : 154 :: 195

2900
1875
8729
3504

+ 22.4 ohms

62c

202 - 200

(404
134 Volts

$$\frac{37650 + 1500}{200} \quad 195$$

16

37650
1500
2)39150
195

20)39150(195
2
191
180
115

✓

63 e

205 - 205

$\frac{410}{136}$ Volts

$$\frac{31400 + 3500}{2000}\ 174^{2}$$

16

31400
3500

$2\,|\,\underline{34900}$
174

205
2

$3\,|\,\underline{410}$
136

✓

136 : 154 :: 174

2405
1875
8665

2945

197
174

+23 Ohms

64 @

222 - 222

37650 + 7000   146

200

223

222
2

1/6 $3\overline{)444}$

146

2   2

37650
7000

20446502 2 3

40

46
0

65 @

200 - 200 133

$\frac{37650+25000}{200}$ 200

16

$\frac{3400}{133}$

```
 37650
  2500
------
 40150 @ 200
```

133 : 154 :: 200 :

```
 3010
 1873        231 1/2
 6761        200
-----       ------
 3646    +   31 1/2  Ohms
```

66e

190 — 190   126

$$\frac{31400 + 5000}{200} \quad 121$$

16

$$314\cancel{00}$$
$$50\cancel{00}$$

3)364

121

190 [illegible] 126

67 c

215 − 215 = 143

$$\frac{37650 + 7000}{200} \quad 223$$

16

$$\begin{array}{r} 215 \\ \underline{2} \\ 3\,)\,\underline{430} \\ 143 \end{array}$$

$$\begin{array}{r} 37650 \\ \underline{7000} \\ 200\,)\,44650\,(223 \\ \underline{40} \\ 46 \\ 60 \end{array}$$

68e

190 – 190 126

$$\frac{31400 + 5500}{200} \; 123$$

16

$$\begin{array}{r} 31400 \\ 5500 \\ \hline 3\,|\,\underline{36900} \\ 123 \end{array}$$

69^e

190—190 126 v

$\frac{31400+}{200}$ 157 R

16

192

3|380 2|314

126 157

Tested the Resist
of the light line
for Mr Bachner.
Resist 140

Nov. 9/1880

70 C

184, 184

$\frac{25150 + 5700}{200}$

16

$$\begin{array}{r} 184 \\ 2 \\ \hline 368 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 25150 \\ 5700 \\ \hline 30850 \\ \hline 154.25 \end{array}$$

123 : 154 :: 154.25 :

$$\begin{array}{r} 2.1875 \\ 2.1875 \\ 7.9104 \\ \hline 28.51 \end{array}$$

$$\begin{array}{r} 192.7 \\ 150 \\ \hline 38 \end{array}$$

+ 38 ohms

71^{c}

mekke no 2

213 - 215

$$\frac{31400 + 6700}{200}$$

16

72e

Nickel No 1

204 − 200

$$\frac{31400 + 5500}{200}$$

31400
5500
36900

18450

1.34 : 154 :: 184.5

202
200
402
134 Volts

1894
2659
8799
3342

215
184.5
+ 30.5 Ohms

Stop here to test Dr
Nickels meter.
leading wires .33 ohm
with meter 2.85

2.85
33

2.52 ohms.
This was when
I was in Denver.

7~~8~~4c

~~A Special experiment~~-

228-228

228
228
456
152

37650 ± 1500
2——)

16

37650
1500
39150
195.75

152; 154; 195.75;

2916
1875
8182
2973

198
195.75
+ 2.25

2 1/4 Ohms

75C

Nickel No 2

195 – 195

195
195
390
130

31400 + 3700
2000

31400
3700
35100
1755

16

19

180 : 154 :: 175.5 :

2[illegible]
18[illegible]
8861
3166

201
1755
+ 255 Ohms

76

(Nekle no 2)

$$\frac{37650 + 4000}{2000}$$

16

$$\begin{array}{r} 37650 \\ \underline{4000} \\ 20 \,\big)\, 41650 \;(208 \\ \underline{40} \\ 1 \end{array}$$

77e

Nickel 402

140

210 - 210

$$\frac{37650 + 4500}{2000}$$

16

37650
4500
42150
21075

140 : 154 :: 210¾ :

3237
1875
8539
3651

232
210¾
+ 21¼ Ohms

$$\begin{array}{r} 238\tfrac{2}{2} \\ 3\overline{)476} \\ 158 \end{array}$$ 2c

[illegible]

Nov. 9

Camp put them at this day
at 8.30 in the night.

74c lasted. 10.9 o'clock

56c
65c Nov. 12
8c
~~[illegible]~~c

10.10.32

Nov 9 1

Meter Check at

9.53.

(10.3'.32"
10.)

10 27 21
10 15 7
1214

10 3 32
10 15 7
10: 3 32
9
25

8

10 15 67
10 3 32
11: 35

six

9
10 53
9.5 3

~~1053~~
10 63 32
9.5 3
10.32

10.15 7
10 3 32
11.35 Live Came 0.

10.15' 7"
10.27 21
12.14 } Right

50
32
311

10 39 21
10.27 21 } Left
12.0

10 39 21
12 14
51 35

10 51 20
10 39 21
11.59 Right

58
50
21
59

51 20
12
63:20

11.15 26
11 5 9

26 85
27

85
60
25

62
20
42

63
51
12

11 27 25
12 4

39 : 29

62
51
11

3 22
11 59

14 81
60
15 : 21

7 10
~~8~~5
26
59

10 15 7
10 . 27 21
12 . 14 } Right

10 39 21
10 27 21
12' } left

10 51 20
10 39 21
11 : 59 } Right

11 3 22
10 51 20
12' . ~~4~~2" } left

11 15 . 26
11 3 22
12 4 } Right

11 27 25
11 15 26
11 59 } Left

11 39 33
11 59

50 92
50 32

50
39

11

20
62

82
33

49

11 39 33
11. 27. 25

12 8

} Right

51 22
11 39 33

11. 49

} Left

2.17609
2.17609
1.64640
7.62343

3.62201

4170 ftlbs

78e

37687 × 80.800
225 —— 225

37687
10000
2)47687
238 Ohms

(e)

16

228
225
3)450
150 Volts.

126
126
756
252
126
15876
44.3
47628
63504
63504
70330.6

3868)33000(85
3088
2120
~~06~~
30

182)703306(3860
5466
1573
1456
1170

~~4~~c 79c

190 ~~+~~ 190
31406 + 5000
200
16

1.90
1.90
3.80
1.26 Volts

31406
5000
36406
1.82 Ohms

[illegible]

190 - 190

31406 + 4300

[illegible]

16. 178 [illegible]

81 @

197 – 197

$$\frac{37687 + 45000}{200}$$

16 [illegible]

82e

203-205

37687+2700

16 = 28[illegible]

83c

1192 — 192

37687 + 7500

16 17561:110

84e

210 – 210

37687 + 5000

16 223 ohms

19+ 191
37684

16 188 ohms

86e

202 — 202
37687+ 3[illegible]

16 203 [illegible]

87C

192 – 192

31406 + 4800

16 179 [illegible]

ffe

195 – 195

37687 + 3000

16 203 ohms

185 – 185

31406+3700

16 175– [illegible]

90e

195 – 196

37687 + 2000

16 198 Junio

207 - 207

37640
2406
20 | 40120
208

36840
2840
20 | 39666
298.20

46407
6032
4041
5862
20 | 52342
261

34680
3602
20 | 38282
291

35687
4680
20 | 40367
201

5608
3807
5680
20 | 14095
70

15 klif.   1 D—
13   2 ond
120 tried to get 150
current broke on one
0. klif
110 klif.
122 klif
126 klif.
123 klif.
122 klif.
0 klif
~~160~~
160   [illegible] to 750 klif.
168
170
160.
164
0 klif
150 klif
0 "
105 "

~~1800~~

139
2
3 | 278
92 2/3

162
2
3 | 324
108

322
2
644
214

7·360
4
1440
2
2880
6
17280
3
57840
2
103680

120
2
3 | 240
80

406 420
2
842
6 | 8421
70

139
2
3 | 378
129

148
2
3 | 296
98 2/3
4083
4062
3041

147
2
3 | 294
98

11196
5598

142
2
3 | 284
94 2/3

130
2
3 | 260
86 2/3
86

Second Test—

~~2 ohms~~ 2 ohms

142 Neg. 2 ohms
139 Neg. [illegible] "
142 "
130 " [illegible] "
0 Neg.

3780
4760
3268
4832
20)175~~40~~
87
870 [illegible]

4760
3210
[illegible] 17976
39

10680
3226
222.4

[illegible] 727~~20~~
368

7608
3642
20)13726
4760 2896
3226

20)50726
2542

4680
3242
4274
121.[illegible]

47880
2100
~~20~~ 50328
2524/2

6015
360.4

203

91© nickel vol

204,204,

37687+ 2500

16

92^c mekke no f

200 198

37687 + 20000

16

9·3 e Middle hol

215 – 215

37657 +1000000

16

94^{c} malleinol

~~180 – 180~~ 182 – 182

31406 + ~~4000~~

16

95^c [illegible]

2000 - 2000
37687+1500

16

202 - 202

37687 + 4 tow

16

97c

200 - 200

3768746000

16

98°

Burned Chas with
very [illegible] [illegible]

[illegible] 101

180 - 180

31406 + 2000

16

~~[illegible]~~
106

175 - 175

31406 + 4[illegible]

16

102e

187 – 187

37680 + 1700

16

44

$\begin{array}{r}1000\\44\\\hline 956\end{array}$

44 : 95.6 :: 1 : U

$44)\,95.6\,(2.1$

88

7.6

44

320

1.00e

175 −175

3140.6

16

109C

194-194

37687 + 3000

106

X

195 - 198

37687+1700

16

99e

217 – 217 [illegible]

37687 + 9000

16

220-.279
37687+1000

16

104^c

to high R

$$\frac{(BC+CE)(AB+EA)}{BC+CE+AB+EA} = \frac{BC.AB.CE+BC.AB.EA+CE.EA.BC+CE.EA.AB}{BC.CE+AB.CE+BC.EA+AB.EA}$$

$$AB.BC+AB.CE+BC.EA+CE.EA =$$

$BC = a$, $CE = b$, $AB = c$, $EA = d$,

$$\frac{(a+b)(c+d)}{a+b+c+d} = \frac{ac}{a+c} + \frac{bd}{b+d}.$$

$$\frac{(a+b)(c+d)}{a+b+c+d} = \frac{ac(b+d)+bd(a+c)}{(a+c)(b+d)}$$

$$(a+b)(c+d)(a+c)(b+d) = ac(b+d^2+bd(a+c)(b+d) + ac(a+c)(b+d)+bd(a+c)^2$$

$$2abcd = a^2c^2+b^2d^2.$$

---

too high R

$$\begin{array}{l} a+b \\ \underline{c+d} \\ ac+bc+ad+bd \\ \underline{a+c} \\ a^2c+abc+a^2d+abd+ac^2+bc^2+adc+bdc \\ \underline{b+d} \end{array}$$

abe abe

ceea

$be^2 = = bee$

$$X = \frac{(Be + Ce)(aB + Ea)}{Be + Ce + ab + Ea}$$

[illegible] $BC.AB(CE+EA)+CE.EA(BC+AB)$

$$\frac{AB \cdot BC + AB.CE + EA.BC + EA.CE}{BC + CE + AB + EA} =$$

$$\frac{AB(BC+CE) + EA(BC+CE)}{(BC+CE)+(AB+EA)} = \frac{BC.AB}{BC+AB} + \frac{CE.EA}{CE+EA}$$

$(BC + CE)(AB + EA)$

205

205 205

37600 + 1000

16

$$\begin{array}{r} Bc + Cc \\ \underline{ab + Ca} \\ ab^c c + abcc \\ \underline{Bcca + cc^2 a} \\ \underline{ab^2 c + 2abcc + cc^2 a} \\ Bc + Cc + ab + Ca \end{array}$$

u

$$\begin{array}{r} 32 \\ \underline{5} \\ 160 \end{array}$$

$$\frac{5}{9}7 \quad \frac{57}{9} - \frac{160}{9} = 45$$

$$\begin{array}{r} 45 \\ \underline{9} \\ 405 \\ \underline{160} \\ 5\overline{)565} \\ 113 \end{array}$$

4

$$\begin{array}{c} ab \\ bc \\ \hline ab^2c \end{array} \qquad \begin{array}{c} ce \\ ca \\ \hline c^2ca \end{array}$$

$$\frac{ab^2c}{bc+ab} \quad c^2ca \qquad \begin{array}{c} ce \\ ea \\ \hline ce^2a \end{array}$$

$$\frac{ab^2c}{bc+ab} + \cancel{c^2a}\ \frac{ce^2a}{ce+ea}$$

$$\frac{abc}{c+a} \quad \frac{cea}{c+a}$$

C
O
N
H
Cl
Fl
Br
S
P
Si
B
Sel
g:

70 ✓
76 No D
72 ✓
74 ✓
75 ✓
77 —
82 ✓
65 ✓
63

675